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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,209	01/11/2002	Mark E. Southwood	1356.2.19	9759

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EXAMINER	
BARTH, VINCENT P	
ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/044,209	SOUTHWOOD, MARK E.	
	Examiner	Art Unit	
	Vincent P. Barth	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *0702*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5-11, 13-19 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castore, et al., U.S. Pat. No. 5,521,707 (28 May 1996).

3. Referring to Claims 1, 2, 5, 10, 14 and 18, Castore discloses a system for determining the dimensions and form of a contoured workpiece such as a threaded workpiece (col. 1, lns. 18-20), as well as other contoured objects such as gears and cold forming dies (col. 1, lns. 10-14). Therefore, Castore is not limited to any particular contoured shapes, and is thus broad enough to encompass shafts which develop a crown during machining or as a result of mechanical wear. The instant Specification describes a broad variety of contoured workpieces of symmetric or axially irregular shape, including those with crown portions, concave portions, or a multiplicity of both (Specification at pg. 1, second para.). A threaded bolt may be fairly characterized as having a multiplicity of crown portions (referred to as "crests" in Castore), and concave portions (referred to as "roots" in Castore). Indeed, the contours of a threaded bolt are more complex than those on a shaft which develops a single crown or a single concavity during mechanical wear, and thus a system which might measure a threaded contour would be of definite utility to

such simpler contours. Castore discloses that various diameters of the workpiece may be calculated: the "major diameter" and the "minor diameter" (see Fig. 1A, elements 18 and 22; and col. 4, lns. 36-37). Castore discloses that the distance (i.e. proximity) to the workpiece is determined by triangulation (col. 2, ln. 64) using a laser 100 as the light source (Figs. 2 and 3; col. 5, ln. 30). Castore does not explicitly use the term "wireframe" as in the instant Application and claims. However, Castore discloses that the computer calculates/derives the "form" or "profile" (col. 2, ln. 65) of the workpiece (see Figs. 4, 5B and 6B) from the distance (i.e. proximity) measurements (col. 7, lns. 30-60). Thus, the description of the calculated "profiles" in Castore is construed herein to be equivalent to the term "wireframe" used in the instant Application and in Claim 1. Castore discloses a computer 220 which implicitly has memory (see MPEP §2144.01), and explicitly discloses an armature 210 with several degrees of freedom to hold the sensor head 100 (Figs. 2 and 3; col. 5, lns. 13-37). Castore does not explicitly disclose that the sensor head moves along three parallel lateral tracks with respect to the workpiece (as in instant Claim 1). However, Castore discloses that the sensor head 100 may move with several degrees of freedom with respect to the workpiece (Figs. 2 and 3; col. 5, lns. 13-37). Moreover, Castore discloses that either the part, or the sensor head, or both, can move with respect to each other (col. 5, lns. 16-17). Clearly, the sensor head 100 may be moved along lateral tracks with respect to the workpiece surface 110 by means of the vertical motion stage 180 (Figs. 2 and 3), and the threaded workpiece may rotate along its own central axis by means of the rotary motion stage 120 to allow for three or more parallel tracks to be scanned (see Figs. 2 and 3, especially the looped arrow drawn on rotary motion stage 120). The Specification in the instant Application does not disclose why the limitation of three parallel lateral tracks is a critical

limitation over the prior art in which any variety of tracks suitable to the particular geometry of the workpiece surface might be used. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Accordingly, the limitation of three parallel lateral tracks represents a non-critical limitation, and would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results.

4. Referring to Claims 3, 15 and 22, Castore does not use the term "crown" to describe peaks in the contours on the workpiece as in the instant Specification, but rather, describes a broad variety of contoured workpieces of symmetric or axially irregular shape, including those with crown portions, concave portions, or a multiplicity of both (Specification at pg. 1, second para.). A threaded bolt may be fairly characterized as having a multiplicity of crown portions (referred to as "crests" in Castore). Thus, the description of the calculated "crest" in Castore is construed herein to be equivalent to the term "crown" used in the instant Application and in Claim 3. Accordingly, the limitation claimed would have been obvious to those skilled in the art at the time of the invention based on the disclosure in Castore.

5. Referring to Claims 6, 7 and 16, Castore discloses optics 556 to direct the incident laser light to the surface of the workpiece, and optics 554 to direct the light reflected from the surface of the workpiece to the detector (see Fig. 5A).

6. Referring to Claims 8, 9, 13, 17, 21 and 23, Castore discloses that the system includes a computer 220 which calculates, *inter alia*, the crest heights (i.e. the surface configurations, or crowns), and which stores the data in such a manner as to create indexes of crest heights (col. 7, lns. 30-60; and Fig. 6A). Implicit in the disclosure of a computer and the storage of data for

creating the indexes of crest heights is an archive feature or memory in the computer. See MPEP §2144.01. Castore discloses that the profile of the workpiece is displayed on the computer screen (see Figs. 4, 5B and 6B) based on the distance (i.e. proximity) measurements (col. 7, lns. 30-60).

7. Referring to Claims 11 and 19, Castore discloses that in connection with determining such profile features as the crest, the slope of the workpiece surface is calculated (col. 8, lns. 15; Fig. 8).

8. Referring to Claim 24, Castore discloses a system for determining the dimensions and form of a contoured workpiece such as a threaded workpiece (col. 1, lns. 18-20), as well as other contoured objects such as gears and cold forming dies (col. 1, lns. 10-14). Therefore, Castore is not limited to any particular contoured shapes, and is thus broad enough to encompass shafts which develop a crown during machining or as a result of mechanical wear. The instant Specification describes a broad variety of contoured workpieces of symmetric or axially irregular shape, including those with crown portions, concave portions, or a multiplicity of both (Specification at pg. 1, second para.). A threaded bolt may be fairly characterized as having a multiplicity of crown portions (referred to as "crests" in Castore), and concave portions (referred to as "roots" in Castore). Indeed, the contours of a threaded bolt are more complex than those on a shaft which develops a single crown or a single concavity during mechanical wear, and thus a system which might measure a threaded contour would be of definite utility to such simpler contours. Castore discloses that various diameters of the workpiece may be calculated: the "major diameter" and the "minor diameter" (see Fig. 1A, elements 18 and 22; and col. 4, lns. 36-37). Castore discloses that the distance (i.e. proximity) to the workpiece is determined by

triangulation (col. 2, ln. 64) using a laser 100 as the light source (Figs. 2 and 3; col. 5, ln. 30). Castore does not explicitly use the term "wireframe" as in the instant Application and claims. However, Castore discloses that the computer calculates/derives the "form" or "profile" (col. 2, ln. 65) of the workpiece (see Figs. 4, 5B and 6B) from the distance (i.e. proximity) measurements (col. 7, lns. 30-60). Thus, the description of the calculated "profiles" in Castore is construed herein to be equivalent to the term "wireframe" used in the instant Application and in Claim 1. Castore discloses a computer 220 which implicitly has memory (see MPEP §2144.01), and explicitly discloses an armature 210 with several degrees of freedom to hold the sensor head 100 (Figs. 2 and 3; col. 5, lns. 13-37). Castore does not explicitly disclose that the sensor head moves along three parallel lateral tracks with respect to the workpiece (as in instant Claim 24). However, Castore discloses that the sensor head 100 may move with several degrees of freedom with respect to the workpiece (Figs. 2 and 3; col. 5, lns. 13-37). Moreover, Castore discloses that either the part, or the sensor head, or both, can move with respect to each other (col. 5, lns. 16-17). Clearly, the sensor head 100 may be moved along lateral tracks with respect to the workpiece surface 110 by means of the vertical motion stage 180 (Figs. 2 and 3), and the threaded workpiece may rotate along its own central axis by means of the rotary motion stage 120 to allow for three or more parallel tracks to be scanned (see Figs. 2 and 3, especially the looped arrow drawn on rotary motion stage 120). The Specification in the instant Application does not disclose why the limitation of three parallel lateral tracks is a critical limitation over the prior art in which any variety of tracks suitable to the particular geometry of the workpiece surface might be used. Applicants have not set forth any new and unexpected results over the prior art obtained with this feature. Accordingly, the limitation of three parallel lateral tracks

represents a non-critical limitation, and would have been obvious to those skilled in the art at the time of the invention. See MPEP §2144.05(III) and §§716.02-716.02(g) for a discussion of criticality and unexpected results. Castore discloses that the system includes a computer 220 which calculates, *inter alia*, the crest heights (i.e. the surface configurations, or crowns), and which stores the data in such a manner as to create indexes of crest heights (col. 7, lns. 30-60; and Fig. 6A). Implicit in the disclosure of a computer and the storage of data for creating the indexes of crest heights is an archive feature or memory in the computer. See MPEP §2144.01. Castore discloses that the profile of the workpiece is displayed on the computer screen (see Figs. 4, 5B and 6B) based on the distance (i.e. proximity) measurements (col. 7, lns. 30-60).

9. Claims 4, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castore, et al., U.S. Pat. No. 5,521,707 (28 May 1996), in view of Salinger, U.S. Pat. No. 4,989,984 (5 Feb. 1991).

10. Referring to Claims 4, 12 and 20, Castore discloses all of the limitations from the base claim except that a roughness detector is configured to receive a second portion of reflected light indicating surface roughness. Castore explicitly suggests that the system may be configured to measure, *inter alia*, the surface roughness of the surface (col. 4, ln. 37), but does not provide explicit details on how such would be accomplished. Salinger discloses a system for measuring both the distance to a workpiece surface by triangulating a laser (col. 2, ln. 61-68; col. 3, ln. 14; col. 8, lns. 38-43). Salinger further discloses that the system determines the surface roughness/characteristics by means of analyzing the so-called penumbra of light scattered from the surface which impinge upon secondary portions of the CCD detector 30a-30g (see Fig. 6 and

col. 6, ln. 63 to col. 7, ln. 12). Castore and Salinger are analogous art, since they are from a similar problem solving area, in that each involves calculating the distance (i.e. proximity) to a curved workpiece surface and measuring the surface roughness with a laser. See Medtronic, Inc. v. Cardiac Pacemakers, 721 F.2d 1563, 1572-1573, 220 USPQ 97, 103-104 (Fed. Cir., 1983). The motivation for combining the Salinger reference with the Castore reference would have been to provide the particular details of measuring surface roughness from Salinger which were omitted in the Castore reference. Accordingly, it would have been obvious to those skilled in the art to combine the references, at the time of the invention, in order to obtain such benefit.

CONCLUSION

11. Applicant's Claims 1-24 are rejected based on the reasons set forth above.

12. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 703-605-0750, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9306.

13. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 703-308-4881.

14. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

Richard A. Rosenberger
Primary Examiner